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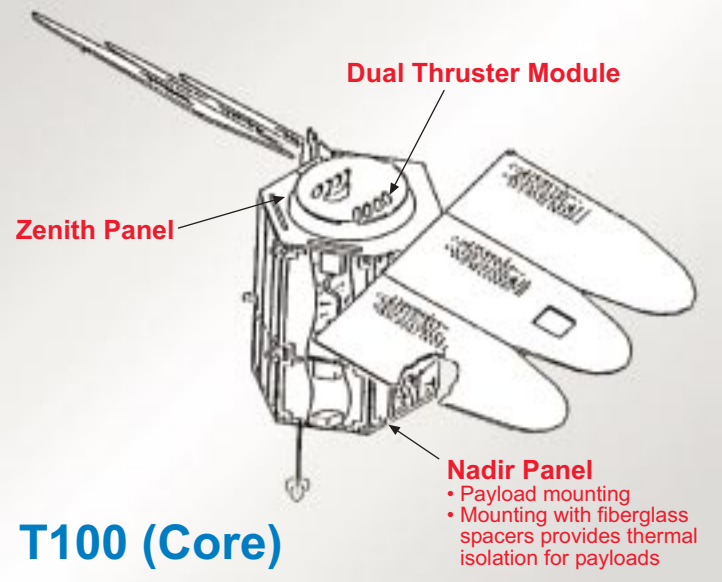
Rapid Spacecraft Development Office

T100 Spacecraft

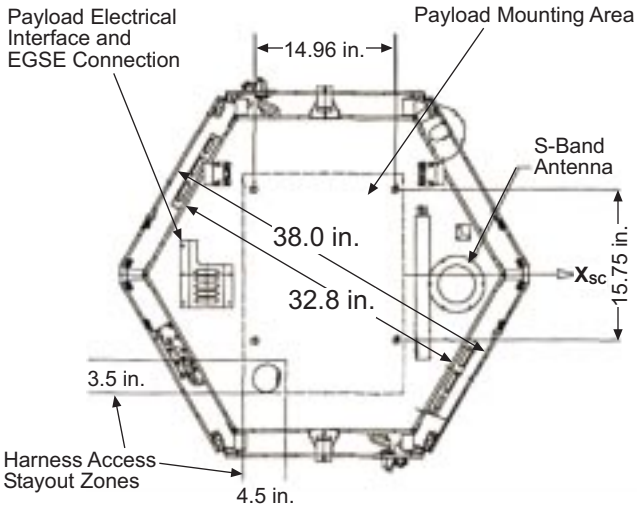


T100 (Core)

The T100 offers the Rapid II users a cost-efficient, fully redundant, flexible core system, which has been flight-proven on the successful TOMS-EP program. The spacecraft is capable of flying in sun- synchronous (noon local crossing ± 2 hours) low earth orbit (LEO) at altitudes ranging from 350 km to 1,000 km. The flight-proven, fully redundant T100 core spacecraft has a design life of 3 years with an end of life (EOL) reliability of 0.914. A cost saving option with no propulsion subsystem is also offered.

T100 Final Integration

T100 on LV Adapter



T100 Top Payload Area

Key System Features

- Build to print version of TOMS-EP spacecraft
- All components available and flight qualified
- Modular design allows parallel payload integration
- Compatible with the Pegasus LV
- Propellant capacity: 73 kg, monopropellant
- Earth-oriented, three-axis, pitch momentum bias
- Simple aluminum structure
- Battery clamped power with silicon solar array
- Monoprop propulsion system, 8 1-lbf thrusters
- 80C86-based spacecraft and data processors
- Integral data storage
- GSTDN compatible S-band Xponder with CCSDS

Payload Accommodations

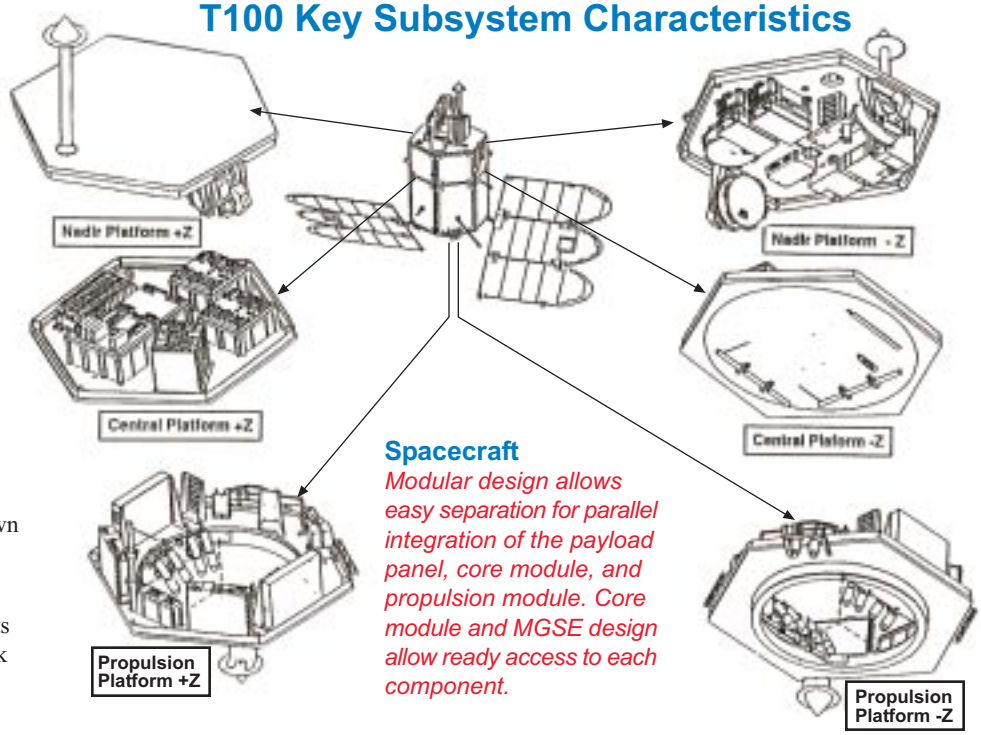
- Reference orbit of 750 km, Noon Sun Synchronous
- Payload mass = 36 kg, on-orbit power = 25 watts
- Attitude control
  - Accuracy: 0.3° P/R, 1.0° Y
  - Knowledge: 0.25° P/R/Y
  - Jitter: <0.005° above 3 Hz per axis
  - Stability: <0.1°/min per axis
- RS-232 standard serial payload interfaces
- Power: Fused, relayed, unregulated 28 +/- 6 Vdc
- 16.7 Mbytes of storage (24 hours of data), with simultaneous playback and recording
- Memory margin = 64%, throughput margin = 72%
- Downlink rate: 200 kbps

T100 Key Subsystem Characteristics

Payload Panel
- Nadir panel for payloads
- Provides unobstructed FOVs

Thermal Control
- Flight proven passive techniques
- Battery cooled on radiator panel, no heat pipes

Propulsion
- Simple, monoprop, hydrazine, blow-down system
- Thrusters location minimizes contamination effects
- 73 kg propellant tank

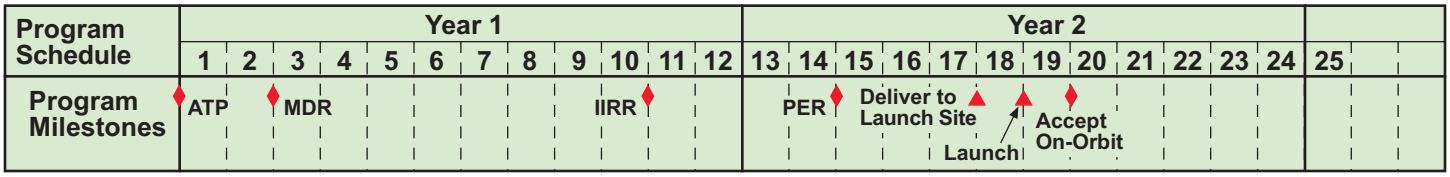


Spacecraft
Modular design allows easy separation for parallel integration of the payload panel, core module, and propulsion module. Core module and MGSE design allow ready access to each component.

Attitude Control
- Scan wheels for earth attitude reference and momentum management
- Reaction wheels for momentum management
- Coarse and fine sun sensors
- Magnetic Torquers to unload momentum
- Gyro propagated attitude

Structure
- All-aluminum structure, proven design
- Fixed solar arrays stowed in wrap around design

Electrical Power
- Silicon solar array, cells on both sides
- Provides robust source of power
- 22-cell, 9 amp hour battery



T100 Mass and Power

Subsystem	Mass, kg	Avg. Load W
Structure	66.9	0.0
Thermal	4.0	16.7
Propulsion	16.5	0.5
EPS with losses	53.2	11.2
ACS	25.7	32.8
C&DH/TT&C	17.9	23.9
LV Adpater	1.2	0.0
Total SC	**185.3**	**85.0**
Propellant *	73.0	0.0
Payload	36.0	25.0
Launch Total	**294.3**	**110.0**

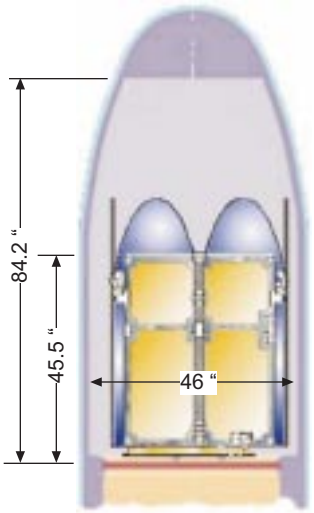
LV = Pegasus XL with HAPS parking orbit = 350 km, sun sync includes contingency

T100 Performance

	Units	Capability
Spacecraft Bus Mass	kg	184
Spacecraft Bus Power	W	85
Payload Mass	kg	36*
Payload Power (EOL)	W	25
Battery Size	amp-hr	9*
Propellant Mass	kg	73
Downlink Rate	Kbps	200
Data Storage (EOL)	Mbits	16.7
Attitude Knowledge R/P/Y	arcsec	694
Attitude Accuracy R/P/Y	arcsec	833/833/2777

** Can be augmented for mission-specific delivery order*

T100 in LV




Successful Launch

TRW

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